



Mark Scheme

Pearson Edexcel GCSE (9 – 1) Maths (1MA1) and Level 2 Extended Maths Certificate Revision Practice

Linear graphs

This practice paper contains questions from GCSE Maths shadow papers, International GCSE past papers, AS level papers and legacy A level papers. Questions marked as non-calculator came from non-calculator papers.

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General marking guidance

These notes offer general guidance, but the specific notes for examiners appertaining to individual questions take precedence.

- 1** All candidates must receive the same treatment. Examiners must mark the last candidate in exactly the same way as they mark the first.

Where some judgement is required, mark schemes will provide the principles by which marks will be awarded; exemplification/indicative content will not be exhaustive. When examiners are in doubt regarding the application of the mark scheme to a candidate's response, the response should be sent to review.

- 2** All the marks on the mark scheme are designed to be awarded; mark schemes should be applied positively. Examiners should also be prepared to award zero marks if the candidate's response is not worthy of credit according to the mark scheme. If there is a wrong answer (or no answer) indicated on the answer line always check the working in the body of the script (and on any diagrams), and award any marks appropriate from the mark scheme.

Questions where working is not required: In general, the correct answer should be given full marks.

Questions that specifically require working: In general, candidates who do not show working on this type of question will get no marks – full details will be given in the mark scheme for each individual question.

- 3** **Crossed out work**

This should be marked **unless** the candidate has replaced it with an alternative response.

- 4** **Choice of method**

If there is a choice of methods shown, mark the method that leads to the answer given on the answer line.

If no answer appears on the answer line, mark both methods **then award the lower number of marks.**

- 5** **Incorrect method**

If it is clear from the working that the "correct" answer has been obtained from incorrect working, award 0 marks. Send the response to review for your Team Leader to check.

- 6** **Follow through marks**

Follow through marks which involve a single stage calculation can be awarded without working as you can check the answer, but if ambiguous do not award.

Follow through marks which involve more than one stage of calculation can only be awarded on sight of the relevant working, even if it appears obvious that there is only one way you could get the answer given.

7 Ignoring subsequent work

It is appropriate to ignore subsequent work when the additional work does not change the answer in a way that is inappropriate for the question or its context. (eg. an incorrectly cancelled fraction when the unsimplified fraction would gain full marks).

It is not appropriate to ignore subsequent work when the additional work essentially makes the answer incorrect (eg. incorrect algebraic simplification).

8 Probability

Probability answers must be given as a fraction, percentage or decimal. If a candidate gives a decimal equivalent to a probability, this should be written to at least 2 decimal places (unless tenths).

Incorrect notation should lose the accuracy marks, but be awarded any implied method marks.

If a probability fraction is given then cancelled incorrectly, ignore the incorrectly cancelled answer.

9 Linear equations

Unless indicated otherwise in the mark scheme, full marks can be gained if the solution alone is given on the answer line, or otherwise unambiguously identified in working (without contradiction elsewhere). Where the correct solution only is shown substituted, but not identified as the solution, the accuracy mark is lost but any method marks can be awarded (embedded answers).

10 Range of answers

Unless otherwise stated, when an answer is given as a range (e.g 3.5 – 4.2) then this is inclusive of the end points (e.g 3.5, 4.2) and all numbers within the range.

11 Number in brackets after a calculation

Where there is a number in brackets after a calculation E.g. $2 \times 6 (=12)$ then the mark can be awarded **either** for the correct method, implied by the calculation **or** for the correct answer to the calculation.

12 Use of inverted commas

Some numbers in the mark scheme will appear inside inverted commas E.g. "12" $\times$ 50 ; the number in inverted commas cannot be any number – it must come from a correct method or process but the candidate may make an arithmetic error in their working.

13 Word in square brackets

Where a word is used in square brackets E.g. [area] $\times$ 1.5 : the value used for [area] does **not** have to come from a correct method or process but is the value that the candidate believes is the area. If there are any constraints on the value that can be used, details will be given in the mark scheme.

14 Misread

If a candidate misreads a number from the question. Eg. uses 252 instead of 255; method or process marks may be awarded provided the question has not been simplified. Examiners should send any instance of a suspected misread to review.

Guidance on the use of abbreviations within this mark scheme

M	method mark awarded for a correct method or partial method
P	process mark awarded for a correct process as part of a problem solving question
A	accuracy mark (awarded after a correct method or process; if no method or process is seen then full marks for the question are implied but see individual mark schemes for more details)
C	communication mark
B	unconditional accuracy mark (no method needed)
oe	or equivalent
cao	correct answer only
ft	follow through (when appropriate as per mark scheme)
sc	special case
dep	dependent (on a previous mark)
indep	independent
awrt	answer which rounds to
isw	ignore subsequent working

Note – Questions have come from different qualifications therefore mark schemes for individual questions may differ.

Section A – GCSE Maths revision questions

Question 1 (Total 5 marks)

Part	Working or answer an examiner might expect to see	Mark	Notes
(a)	$x\text{-coordinate} = 12 \times 3 = 36$ $y\text{-coordinate} = 4 \times 4 = 16$	M1	This mark is given for a method to find the x -coordinate or the y -coordinate of R
	(36, 16)	A1	This mark is given for the correct answer only
(b)	$4 \div 12 = 0.333\dots$	P1	This mark is given for a process to find the gradient of the line L
	$-\frac{1}{-\frac{1}{3}} = -3$	P1	This mark is given for a process to find the gradient of the perpendicular to L
	$y = -3x + 4$	A1	This mark is given for the correct answer only

Question 2 (Total 2 marks)

Part	Working or answer an examiner might expect to see	Mark	Notes
	$4y = 4(3x - 4) = 12x - 16$ $4y = 12x - 16$ or $y - 3x + 4 = 0$ $y = 3x - 4$	M1	This mark is given for a method to manipulate two equations to make a comparison
	Gradient = 3 for both lines So lines are parallel	A1	This mark is given for equations which show gradients of the two lines are the same

Question 3 (Total 3 marks)

Part	Working or answer an examiner might expect to see	Mark	Notes
	$y = \frac{5}{3}x + \frac{8}{3}$	M1	This mark is given for a method to rearrange the equation and identify the gradient
	$\frac{5}{3} \times m = -1$, so perpendicular $= -\frac{3}{5}$	M1	This mark is given for a method to find the gradient of the line perpendicular to L
	$y = -\frac{3}{5}x + c$ $-6 = -\frac{3}{5}x + c$ so $c = -\frac{21}{5}$ $y = -\frac{3}{5}x - \frac{21}{5}$ Rearranging, $5y + 3x = -21$	A1	This mark is given for a correct equation (or any equivalent)

Question 4 (Total 3 marks)

Part	Working or answer an examiner might expect to see	Mark	Notes
	Equation of L ₂ : $4y = 20 - kx$ or $y = 5 - \frac{k}{4}x$	P1	This mark is given for a process to write the equation of the line L ₂ in terms of y
	Gradient of L ₁ = 3 so gradient of L ₂ = $-\frac{1}{3}$	P1	This mark is given for a process to find the gradient of L ₂ as perpendicular to L ₁
	$-\frac{k}{4} = -\frac{1}{3}$ $k = \frac{4}{3}$	A1	This mark is given for the correct answer only

Question 5 (Total 5 marks)

Part	Working or answer an examiner might expect to see	Mark	Notes
	$y = 9 - 3x$	P1	This mark is given for a process to rearrange to give the equation of the line perpendicular to PQ in terms of x
	Gradient of $PQ = \frac{1}{3}$	P1	This mark is given for a process to find the gradient of PQ using $mn = -1$
	Equation for PQ is $y = \frac{1}{3}x + c$	P1	This mark is given for a process to find an equation for PQ
	$y = \frac{1}{3}x + c$ at $(3, 4)$ $4 = 1 + c$ $c = 3$	P1	This mark is given for finding the value of c
	$b = \frac{1}{3}a + 3$	A1	This mark is given for a correct answer only

Section B – Level 2 EMC revision questions

Question 6 (Total 2 marks)

Part	Scheme	Marks
	$2x + 4y - 3 = 0 \Rightarrow y = \mp \frac{2}{4}x + \dots$ Gradient of perpendicular = $\pm \frac{4}{2}$	M1
	Either $m = 2$ or $y = 2x + 7$	A1

Question 7 (Total 4 marks)

Part	Scheme	Marks
	States gradient of $4y - 3x = 10$ is $\frac{3}{4}$ oe or rewrites as $y = \frac{3}{4}x + \dots$	B1
	Attempts to find gradient of line joining $(5, -1)$ and $(-1, 8)$	M1
	$= \frac{-1 - 8}{5 - (-1)} = -\frac{3}{2}$	A1
	States neither with suitable reasons	A1

Question 8 (Total 4 marks)

Part	Working	Answer	Mark	Notes
	eg $\frac{4 - (-1)}{6 - 4}$ ($= \frac{5}{2} = 2.5$)		M1	for a method to find the gradient of L
	eg $\frac{-1}{\text{"2.5"}}$ ($= -\frac{2}{5} = -0.4$) or $\frac{-1}{\text{their gradient}}$ oe		M1	ft for a method to find the gradient of M if <i>their</i> gradient of L clearly stated (even if no method shown for gradient of L)
	$y = \text{"0.4"}x + 8$ oe eg $y - 8 = -\frac{2}{5}(x - 0)$ or $(8 \div 2) \times 5 (= 20)$ oe or $8 \div (-\text{'their gradient of M'})$		M1	dep on previous M1 for substitution of (0, 8) into equation for a line or use of $(8 \div 2) \times 5 (= 20)$ (maybe on diagram) NB: 20 gains M3 if clearly intended as x coordinate (stated or on a diagram)
	<i>Working not required, so correct answer scores full marks (unless from obvious incorrect working)</i>	(20, 0)	A1	

Question 9 (Total 12 marks)

Part	Scheme	Marks
a	Gradient of L_1 is $\frac{7-2}{3-0} \left(= \frac{5}{3} \right)$ $m(L_2) = -1 \div \text{their } \frac{5}{3}$ $y-7 = -\frac{3}{5}(x-3)$ or $y = -\frac{3}{5}x + c, \quad 7 = -\frac{3}{5}(3) + c \Rightarrow c = \frac{44}{5}$ $3x + 5y - 44 = 0$	B1 M1 M1A1ft A1
b	When $y = 0 \quad x = \frac{44}{3}$	M1 A1
c	Correct attempt at finding the area of any one of the triangles or one of the trapezia. A correct numerical expression for the area of one triangle or one trapezium for their coordinates. Combines the correct areas together correctly Correct numerical expression for the area of $ORQP$. Correct exact area e.g. $54\frac{1}{3}, \frac{163}{3}, \frac{326}{6}, 54.\dot{3}$ or any exact equivalent	M1 A1ft M1 A1 A1

